Behavioral Research on Distracted Driving

Monday, October 30, 2017

Jonathan Rupp, PhD
Associate Professor, Emory Department of Emergency Medicine

Co-Director, Injury Prevention Research Center at Emory (IPRCE)

Behavioral Methods for Studying Distracted Driving

Crash Data

Page ___ of __

GEORGIA UNIFORM MOTOR VEHICLE ACCIDENT REPORT

Accident Number 1 | Agency NCIC No. 2 | County 3 | Date Rec. by DOT 4

Date 5 | Day of Week 6 ☐ Sun ☐ M ☐ T ☐ W ☐ Th ☐ F ☐ S | Time 7 | Off. Arrived 8 | Total Number of: 9 Vehicles | Injuries | Fatalities | Inside City Of: 10

Road of Occurrence ______11______ 1 ☐ Interstate 2 ☐ Lowest St. Rt. 3 ☐ Co. Road 4 ☐ City St.
At Its Intersection With ______12______ 1 ☐ 2 ☐ Lowest St. Rt. 3 ☐ Co. Road 4 ☐ City St.
Not At Its Intersection But______13____ ☐ Miles ☐ Feet 1 ☐ North 2 ☐ South 3 ☐ East 4 ☐ West Of:______14______ 1 ☐ Interstate 2 ☐ Lowest St. Rt. 3 ☐ Co. Road 4 ☐ city St. 5 ☐ Co. Line
And continuing in the direction checked above, the Next Reference Point is ______15______ 1 ☐ Interstate 2 ☐ Lowest St. Rt. 3 ☐ Co. Road 4 ☐ City St. 5 ☐ Co. Line
Corrected Report? Yes ☐ 16
Suppl. To Original? Yes ☐
Hit and Run ? Yes ☐ 17

Driver 1	Driver 2
Driver # 18 / Ped # ☐ — 19 LAST NAME, FIRST, MIDDLE	Driver # / Ped # ☐ — LAST NAME, FIRST, MIDDLE
Address 20	Address
City, State, Zip, DOB 21	City, State, Zip, DOB
22 Driver's License No., 23 Class, 24 State, 25 ☐ Male ☐ Female	Driver's License No., Class, State, ☐ Male ☐ Female
Posted Speed 26, Insurance Co. 27, Policy No. 28	Posted Speed, Insurance Co., Policy No.
Year 29, Make 30, Model 31, Telephone No. 32	Year, Make, Model, Telephone No.
VIN 33, Vehicle Color 34	VIN, Vehicle Color
Tag # 35, State, County, Year	Tag #, State, County, Year
Trailer Tag # 36, State, County, Year	Trailer Tag #, State, County, Year
37 ☐ Same as Driver, Owner's Last Name, First, Middle	☐ Same as Driver, Owner's Last Name, First, Middle
Address	Address
City, State, Zip	City, State, Zip
38 Removed By, 39 ☐ Request, 40 ☐ List	Removed By, ☐ Request, ☐ List
Alcohol Test 41, Type, Results 42, Drug Test 43, Type, Results 44	Alcohol Test, Type, Results, Drug Test, Type, Results
Driver Cond 45, Direction Of Travel 46, Vision Obscured 47, Contributing Factors 51	Driver Cond, Direction Of Travel, Vision Obscured, Contributing Factors
48 Veh Cond, 49 Veh Maneuver, Ped. Maneuver 50	Veh Cond, Veh Maneuver, Ped. Maneuver
Most Harmful Event 52, Veh Class: 53, Veh Type: 54	Most Harmful Event, Veh Class:, Veh Type:
Traffic Ctrl 55, 56 Device Inoperative? ☐ Yes ☐ No	Traffic Ctrl, Device Inoperative? ☐ Yes ☐ No

Injured Taken To: 57 By:
58 EMS Notified Time | EMS Arrival Time | Hospital Arrival Time | 59 Photos Taken: ☐Yes ☐No By:
60 Report By: | Department | Report Date | 61 Checked By: | Date Checked
62 Witness(es): Name | Address | City | State | Zip Code | Telephone No.

63 DOT MICROFILM NUMBER (DO NOT WRITE IN THIS SPACE)

COMMERCIAL VEHICLES ONLY

Vehicle 1	Vehicle 2
Carrier Name 64, Vehicle # 65	Carrier Name, Vehicle #
66 Address, State, Zip	Address, State, Zip
No. of Axles 67, G.V.W.R. 68, 69 Fed. Reportable 1 ☐ Yes 2 ☐ No, Cargo Body Type 70	No. of Axles, G.V.W.R., Fed. Reportable 1 ☐ Yes 2 ☐ No, Cargo Body Type
Vehicle Config. 71, I.C.C.M.C. # 72, U.S. D.O.T. # 73, Interstate ☐ Intrastate ☐ 74	Vehicle Config., I.C.C.M.C. #, U.S. D.O.T. #, Interstate ☐ Intrastate ☐
75 C.D.L.? 1 ☐ Yes 2 ☐ No 76 C. D.L. Suspended? 1 ☐ Yes 2 ☐No	C.D.L.? 1 ☐ Yes 2 ☐ No C.D.L. Suspended? 1 ☐ Yes 2 ☐ No
77 Vehicle Placarded? 1 ☐ Yes 2 ☐ No 78 Hazardous Materials? 1☐ Yes 2☐No	Vehicle Placarded? 1 ☐ Yes 2 ☐ No Hazardous Materials? 1 ☐ Yes 2 ☐ No
79 Released? 1 ☐ Yes 2 ☐ No	Released? 1 ☐ Yes 2 ☐ No
If YES, Name or 4 Digit Number from Diamond or Box: ____80____	If YES, Name or 4 Digit Number from Diamond or Box: ________
1 Digit Number from Bottom of Diamond: ___81______	1 Digit Number from Bottom of Diamond: ________
__ Ran Off Road __Down Hill Runaway __Cargo Loss or Shift __ Separation of Units	__ Ran Off Road __Down Hill Runaway __Cargo Loss or Shift __ Separation of Units

Uniform Accident Reporting Guide

Page • 14

National Household Travel Survey

Understanding How People Get from Place to Place

U.S. Department of Transportation
National Highway Traffic Safety Administration

NHTSA

DOT HS 812 330 September 2016

Occupant Restraint Use in 2015: Results From the NOPUS Controlled Intersection Study

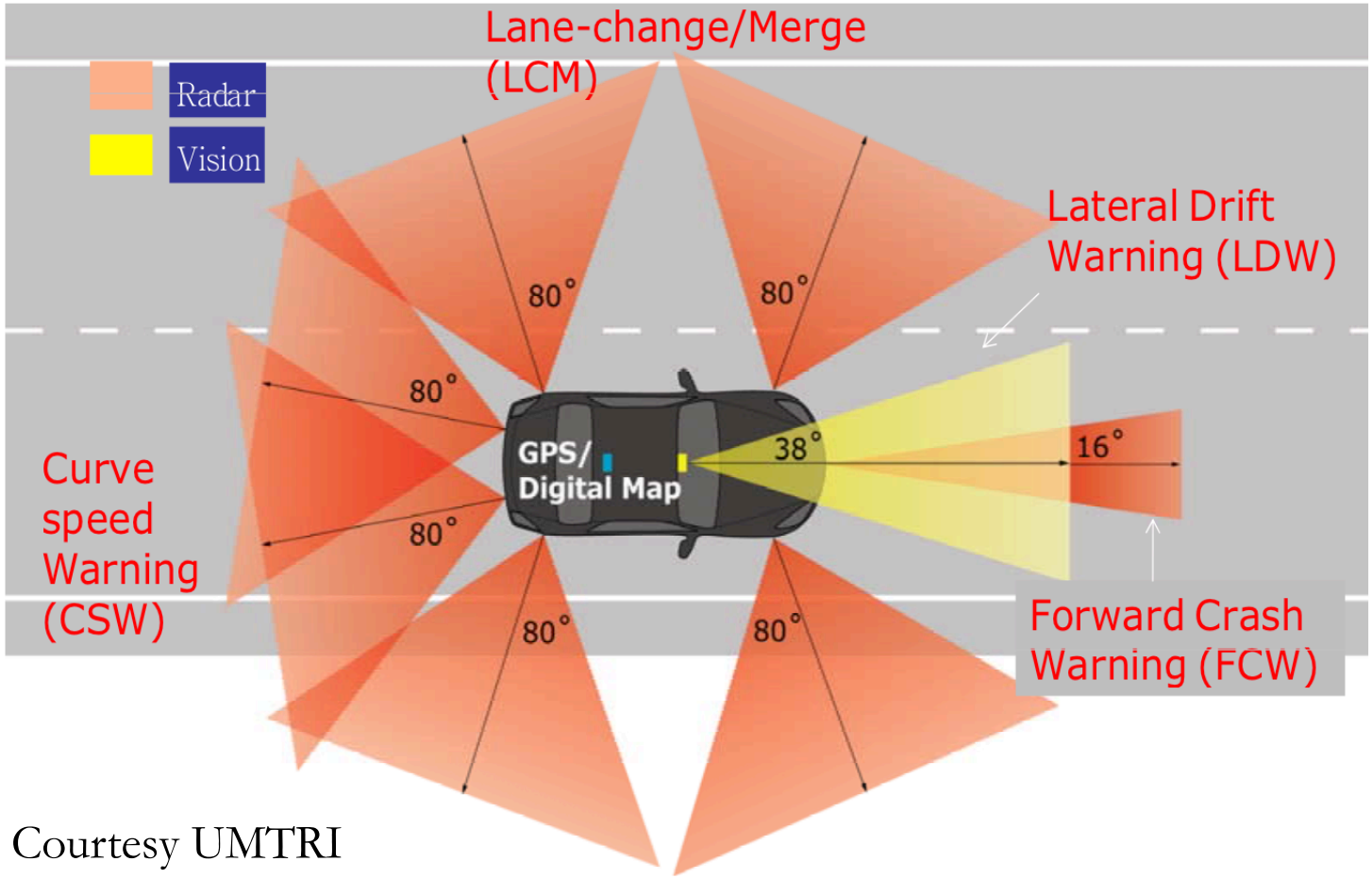
Behavioral Methods for Studying Distracted Driving

Driving Simulators

Courtesy: UMTRI

Behavioral Methods for Studying Distracted Driving: NDS

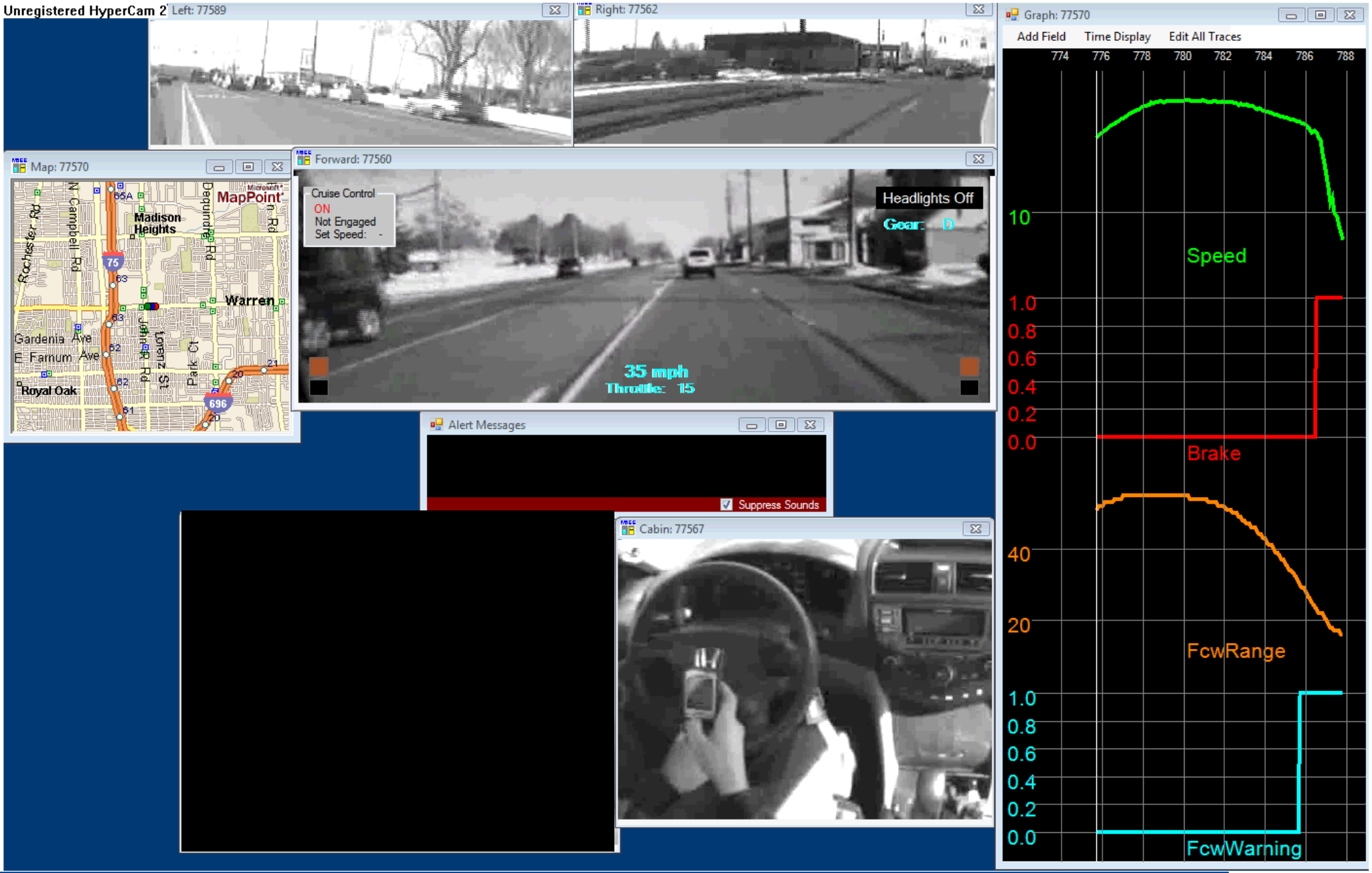
Naturalistic Driving Studies (NDS)



+Exterior and interior video

+Vehicle sensor data

Courtesy UMTRI



Source: UMTRI, IVBSS

EMORY UNIVERSITY SCHOOL OF MEDICINE

SHRP 2 Naturalistic Driving Study

- Largest video based NDS study in US to date, conducted by VTTI
- 3000 participants
- 5.4M trips, 1M hours of video + sensor data
- 1465 crashes, 905 involved injury or property damage
- 2 Petabytes (2 million GB) of data

- Provides objective data on distraction and other driver behaviors as they related to crashes.

SHRP 2 Naturalistic Driving Study Results (Precrash)

Distracted
Yes (68.3%)
No (31.7%)

- Distraction is when a driver's attention is diverted away from driving by an unrelated secondary task, event, or person.
- Includes active interactions with passengers, interacting with in-vehicle and hand held devices, eating/drinking, etc.

Adapted from Dingus et al. (2016)

SHRP 2 Naturalistic Driving Study Results (Precrash)

Distracted	Error
Yes (68.3%)	Yes (54.5%)
	No (13.8%)
No (31.7%)	Yes (19.2%)
	No (12.5%)

Operating errors (speeding and aggressive driving) and maneuver errors (e.g., driving too slowly, improper turn, failure to signal, right-of-way errors, etc.)

Adapted from Dingus et al. (2016)

SHRP 2 Naturalistic Driving Study Results (Precrash)

Distracted	Error	Impaired	Prevalence
Yes (68.3%)	Yes (54.5%)	Yes	3.4%
		No	51.1%
	No (13.8%)	Yes	0.1%
		No	13.7%
No (31.7%)	Yes (19.2%)	Yes	2.7%
		No	16.5%
	No (12.5%)	Yes	0.2%
		No	12.3%
		Total	100.0%

Impairment includes: drugs/alcohol, drowsiness/fatigue, and excessive observable emotion (anger, sadness, crying, excessive agitation)

Adapted from Dingus et al. (2016)

SHRP 2 Naturalistic Driving Study Results (Precrash)

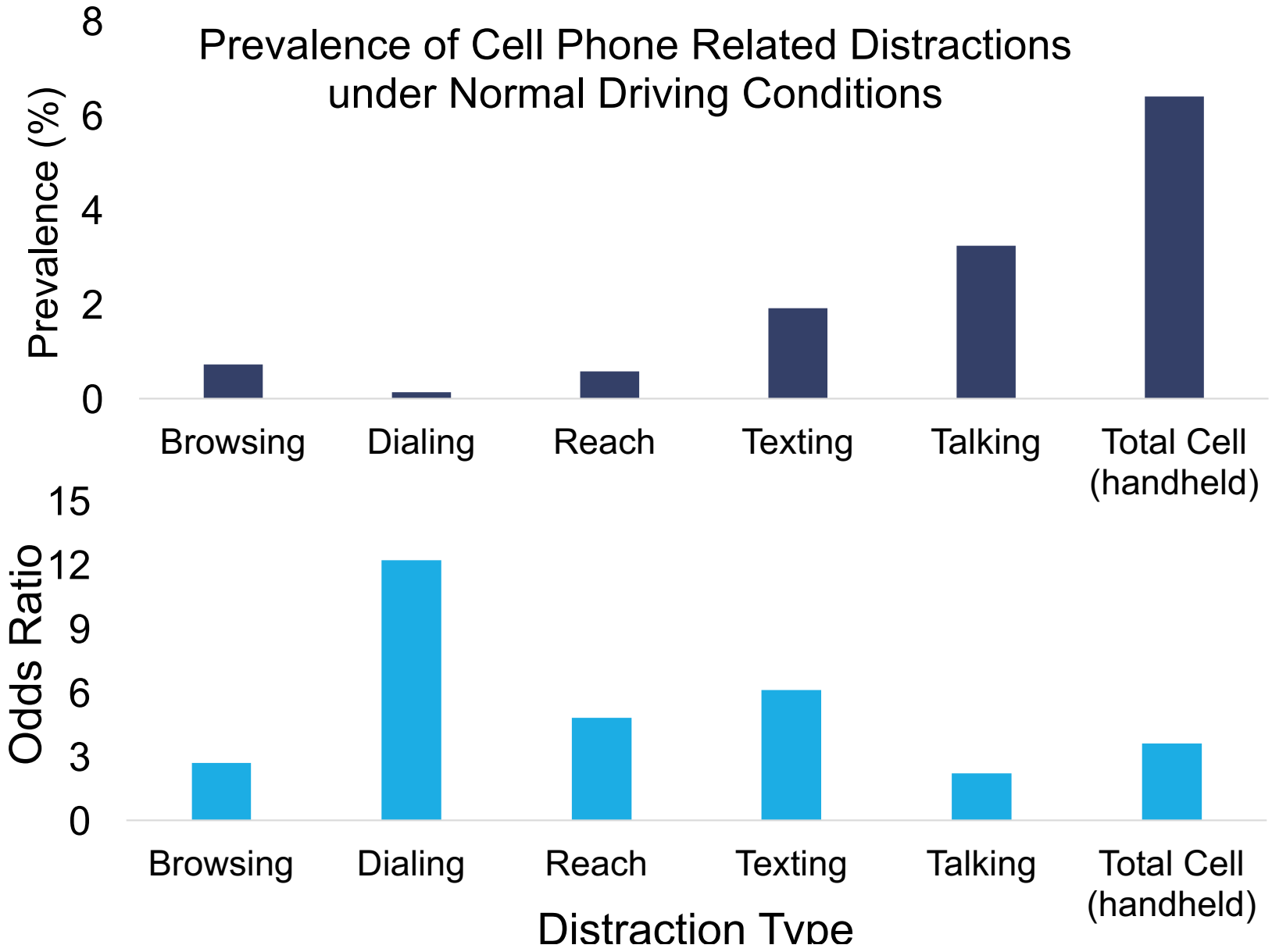
Distracted	Error	Impaired	Prevalence
Yes (68.3%)	Yes (54.5%)	Yes	3.4%
		No	51.1%
	No (13.8%)	Yes	0.1%
		No	13.7%
		No	16.5%
	No (12.5%)	Yes	0.2%
		No	12.3%
		Total	100.0%

Impairment includes: drugs/alcohol, drowsiness/fatigue, and excessive emotion (anger, sadness, crying, excessive

Prevalence of Distraction During Normal Driving: 51%

Adapted from Dingus et al. (2016)

SHRP 2 Naturalistic Driving Study Results



Source

EMORY UNIVERSITY SCHOOL OF MEDICINE

Effects of Handheld Bans

- Effective at reducing hand held use (40% to 50% reduction, Rudisill and Zhu 2017)
- 44% of drivers in states with handheld bans report never using cellphones while driving in contrast to 30% of drivers in states without bans (Braitman and McCartt, 2010)
- Mixed effects on reducing crashes (McCartt et al. 2010).

Take Home Points

- Distraction is common and associated with increased crash risk (2x overall)
- Not all types of distraction have the same effect on crash risk, e.g,. handheld dialing is much more risky than talking on a cell phone (12x vs 2x).
- Handheld cell phone bans reduce handheld use and self-reported cell use in general. Effects of these bans on crashes are mixed.

Thanks for your attention!

JONATHAN RUPP, PHD
JONATHAN.RUPP@EMORY.EDU